Stuttgart, October 19th, 2015

Bridge to Mont Saint-Michel praised and awarded

The Bridge to Mont Saint-Michel, in France, was awarded with the French National Award last 9th September with a spectacular light show. The French National Award is offered to outstanding architectural and engineering design projects, built in France, entirely or partially of steel. The bridge was inaugurated last spring and already lived through the highest flood of the century with praise and appreciation. The award ceremony took place in the beautiful venue 'Showcase' at the Pont Alexandre, in Paris. We are honoured to receive the award and Michael Zimmermann, our French office managing director, represented sbp at the ceremony.
The bridge to Mont Saint-Michel is an exceptional environmental and engineering project that started in 2001. The restoring of the bay to project the island and its full maritime character required more than 10 years of studies, planning, designing and hard work. Completed in 2013, the result is an ingenious solution for the site and an achievement for architecture and engineering.

Image 1: Light show at the Mont Saint-Michel (© sbp / Michael Zimmermann)

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General Information about the Bridge Mont Saint-Michel

The bridge connects the World Heritage Island and the main land facilitating the movement of residents and visitors to the castle and its surroundings whilst preserving the maritime environment and wildlife. The curvature of the design further provides different viewpoints as the island is approached offering changing perspectives for appreciation.

The design was inspired on traditional boating docks and used slender steel columns in order to minimally impact the current and tidal movements. The steel columns and consoles' framework support the concrete slabs that are also minimally spaced to reduce the slabs cross-section; this engineering design lends the bridge the subtle appearance of a floating road, and with high tide, pedestrians may experience the walk with the water just under their feet, giving the impression that the bridge is floating over water.

With a total of 2 km in length, the bridge and the causeway offer road and footpath access; the bridge has a downward gradient of 1% towards the landing platform at the island and at times, the bridge is completely flooded allowing Mont Saint-Michel resumes its island status. Separation elements between the road and pedestrian paths on both sides double function as continuous benches throughout the bridge.

The design is robust and low-maintenance; materials were kept to a minimum and were considered carefully to weather with time and match the medieval and natural surroundings; the steel-concrete composite matched with oak flooring and furnishings, give the bridge the subtle appearance the design required. Minimal illumination and cantilevered footpaths add to the slender shape of the bridge.

Despite the delicate appearance of the bridge, however, this is a highly engineered site. The maritime site has the highest tides in Europe and shifting sand and sediments are in constant flow, with the bay's sand floor expected to be 6 to 8 metres lower in the future. The flow of water was therefore central to the design solution, resulting in the construction of 134 slender steel columns with 12 metres longitudinal spacing between them. Furthermore, the precast concrete slabs integrated under the road carry all utility supplies for and from Mont Saint-Michel and cover the bridge.

The requirements for a very strong foundation resulted in concrete piles being firmly anchored on a rock foundation 30 metres below sea level. This design solution allowed the anchoring to occur without the removal of the layers of sand that accumulated over the years on the causeway. The columns were drilled in-situ and the connection between the concrete pile and the columns occurred 7 metres below the current sand levels, a construction method that allows the environmental changes to occur naturally, which was fundamental to preserving the maritime life of the site.

Each column was designed to a different specification to accommodate the sand levels, and to manage the lateral bedding stiffness. Deformations due to temperature are managed through the number of steel supports on the semi-

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integral bridge that is covered by the prefabricated concrete slabs joint to the structure in-situ.

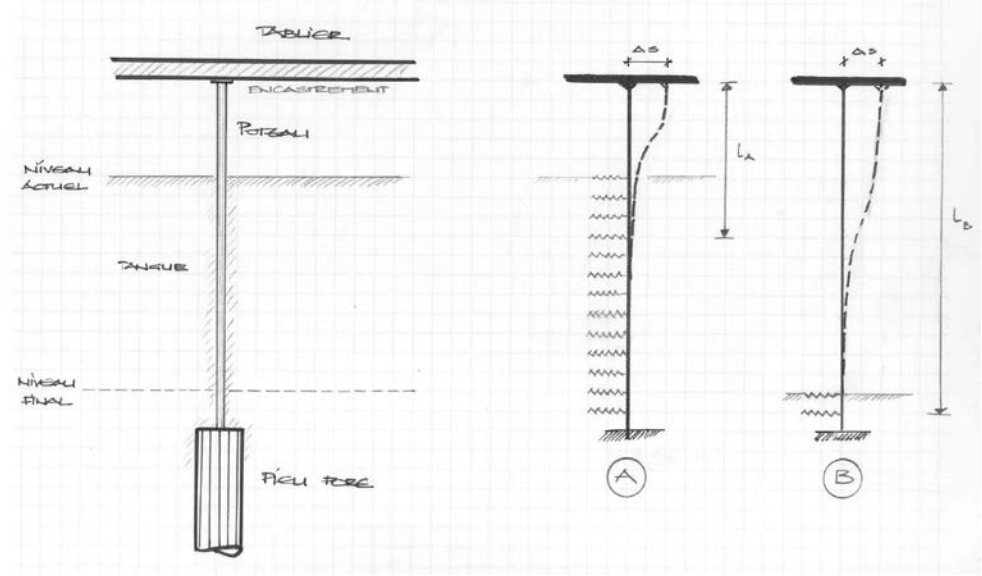

Image 2: Columns behaviour based on different sand levels at the sea floor (© schlaich bergermann partner)

Image 3: New and old access to Mont Saint-Michel (© sbp / Michael Zimmermann)

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Image 4: The new bridge to Mont Saint-Michel (© sbp / Michael Zimmermann)

Technical Specifications

Length:	760 metres (bridge) + 1,000 metres (dam)
Bridge Width:	11.5 metres
Deck Surface:	10,580 m²
Steel columns' longitudinal direction:	12 metres
Total steel columns:	134 units
Sea level tidal range:	up to 14 metres

Parties Involved in the Project Bridge to Mont Saint Michel

Client:	Syndicat mixte de la baie du Mont Saint-Michel
Design Team:	Mandatory: Dietmar Feichtinger Architectes (Architect) schlaich bergermann partner (Structural Engineers)
Construction Companies:	Eiffage Construction métallique (Steelwork) - Main Contractor Eiffage travaux maritimes et fluviaux (Concrete work, abutment) Spie Fondations (Foundation, Piling) Rol Normandie (Infrastructure, Road, Hydraulic Works) Ateliers Aubert Labansap (Wood) BP Métal (Metalworker) Cegelec Ouest (Lightning, Electricity)

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Office profile of schlaich bergermann partner

schlaich bergermann partner are independent consulting engineers.

Since 1980, the year of our foundation, the design and construction of ambitious structures has been the focus of our work. Our projects range from long span lightweight roofs to a diversity of bridges, slender towers, innovative building constructions, and pioneering solar power plants.

We are keen to establish a collaborative partnership with clients, architects and other consultants to create outstanding buildings in a cooperative interaction.

We operate in almost all fields of structural engineering. Our scope of work includes all planning phases ranging from preliminary studies, conceptual design and detailed structural design to the supervision of the construction.
The link to teaching and research via three professorships at universities allows us to include experimental studies (testing of materials and building components, wind tunnel tests) in our projects.

We provide checking engineering and inspection services in both the private and the public sector. Prof. Dr. Ing. sc. techn. M. Schlaich in Berlin and Dr. Ing. J. Gugeler in Stuttgart render these services in their function as accredited checking engineers for stability and structural engineering.

Our solar team is dedicated to develop new technologies for the use of renewable energy and solar radiation. The key technologies within this field of work are the parabolic trough, technology solar power tower systems and Solar Updraft Towers in the field of large-scale solar power plants, and Dish-Stirling systems in the field of decentralized and small-scale power plants, concentrating (CPV) and building integrated photovoltaic systems (BIPV) as well as heliostats in concentrating solar power (CSP) technology.

With our highly qualified team we achieve innovative engineering work beyond our “own” technologies.

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